TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

Perfluorocarbon (PFC) Analysis

Lot #: D9L310441

Dena Haverland

Dalton Utilities
1200 V.D. Parrot Jr. Parkway
Dalton, GA 30721

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Project Manager

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Case Narrative
D9L310441

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

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Sample Arrival and Receipt
The following report contains the analytical results for one sample received at TestAmerica Denver on December 31, 2009, according to documented sample acceptance procedures. The sample was received in good condition at a temperature of 2.3°C. No anomalies were encountered during sample receipt.

Standards
Analytical standards were prepared using commercially available certified solutions containing all compounds of interest.

The mass labeled compounds 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS, 13C4 PFOA, 13C4 PFOS, 13C5 PFNA, 13C2 PFDA, 13C2 PFUnA, 13C2 PFDoA, and D3 MeFOSA were introduced at the extraction step and were used for internal standards for the quantitation of the target compounds.

Sample Extraction and Analysis
The samples presented in this report were extracted for the target analytes by TestAmerica Denver's Standard Operating Procedure (SOP) DV-OP-0019 and analyzed for the target analytes by TestAmerica Denver's SOP DV-LC-0012.

Method QC Samples
The Method Blank is processed reagent water spiked with internal standard and prepared with each batch of 20 samples of the same matrix. The method blanks were non-detect at the reporting limits for the target analytes.

Each batch is prepared with low and mid level Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits.

Analytical Comments
Spike compound recoveries, RPD data, and surrogate recoveries could not be calculated for the laboratory generated MS/MSD associated with QC batch 0004290, because the sample was diluted beyond the ability to quantitate recoveries. The acceptable mid-level and low-level LCS analyses data indicated the analytical system was operating within control.

The Standard Operating Procedure (SOP) was altered slightly for these samples in the sample prep and LC conditions. The alterations are listed below.

Solvents are now the same as they were in the original SOP and run per the following gradient: From 0 to 11 minutes, the flow rate is 0.4 mL/minute and the MeOH ramps up from 25% to 100%. From 11 to 11.01 minutes, the flow rate increases to 0.7 mL/minute and this flow is diverted from the MS. At 13 minutes the flow rate decreases back down to 0.4 mL/minute and 25% MeOH. The column then equilibrates to 14 minutes.

PFTriA and PFTeA now use 13C2 PFUnA as their internal standard instead of 13C2 PFDoA.

No other anomalies were observed.

EXECUTIVE SUMMARY - Detection Highlights

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PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
122109-01 12/21/09 10:43 001				
Perfluoropentanoic acid (PFPA)	5.3	3.0	ug/kg	DEN -LC-0012
Perfluorooctanesulfonate	2.0 J	3.0	ug/kg	DEN -LC-0012
Percent Moisture	34	0.10	%	ASTM D 2216-90

METHODS SUMMARY

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PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Method for Determination of Water Content of Soil	ASTM D 2216-90	ASTM D2216-90

References:

ASTM Annual Book Of ASTM Standards.

DEN Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

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ANALYTICAL METHOD	ANALYST	ANALYST ID
ASTM D 2216-90	Braden H. Peterson	6733
DEN -LC-0012	Teresa L. Williams	002510

References:

ASTM	Annual Book Of ASTM Standards.
DEN	Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

SAMPLE SUMMARY

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WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
LRRHF	001	122109-01	12/21/09	10:43

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Dalton Utilities

Client Sample ID: 122109-01

HPLC

Lot-Sample #...: D9L310441-001 **Work Order #...:** LRRHF1AA **Matrix.....:** SOLID
Date Sampled...: 12/21/09 10:43 **Date Received..:** 12/31/09
Prep Date.....: 01/04/10 **Analysis Date..:** 01/15/10
Prep Batch #...: 0004290 **Analysis Time..:** 09:42
Dilution Factor: 1
% Moisture.....: 34 **Method.....:** DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Perfluorooctane sulfonamide (FOSA)	ND	7.5	ug/kg	1.9
Perfluoroundecanoic acid (PFUnA)	ND	7.5	ug/kg	2.7
Perfluorotetradecanoic acid (PFTeA)	ND	7.5	ug/kg	2.2
Perfluorododecanoic acid (PFDoA)	ND	7.5	ug/kg	1.2
Perfluorotridecanoic acid (PFTriA)	ND	7.5	ug/kg	1.7
Perfluorobutanoic acid (PFBA)	ND	3.0	ug/kg	0.51
Perfluoropentanoic acid (PFPA)	**5.3**	**3.0**	**ug/kg**	**1.3**
Perfluorohexanoic acid (PFHxA)	ND	3.0	ug/kg	0.30
Perfluoroheptanoic acid (PFHpA)	ND	3.0	ug/kg	1.1
Perfluorononanoic acid (PFNA)	ND	3.0	ug/kg	0.75
Perfluorodecanoic acid (PFDA)	ND	3.0	ug/kg	1.1
Perfluorobutane sulfonate (PFBS)	ND	3.0	ug/kg	1.3
Perfluorohexane sulfonate (PFHxS)	ND	3.0	ug/kg	1.2
Perfluorooctanesulfonate	**2.0 J**	**3.0**	**ug/kg**	**0.57**
Perfluorooctanoic Acid	ND	7.5	ug/kg	1.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	120	(50 - 200)
13C4 PFOS	89	(50 - 200)
13C4 PFBA	82	(50 - 200)
13C2 PFHxA	91	(50 - 200)
18O2 PFHxS	88	(50 - 200)
13C5 PFNA	99	(50 - 200)
13C2 PFDA	97	(50 - 200)
13C2 PFUnA	98	(50 - 200)
13C2 PFDoA	88	(50 - 200)
MeFOSA	80	(50 - 200)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Dalton Utilities

Client Sample ID: 122109-01

General Chemistry

Lot-Sample #...: D9L310441-001 **Work Order #...:** LRRHF **Matrix.....:** SOLID
Date Sampled...: 12/21/09 10:43 **Date Received..:** 12/31/09
% Moisture.....: 34

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	**34**	**0.10**	**%**	**ASTM D 2216-90**	**01/04/10**	**0004103**

Dilution Factor: 1 Analysis Time..: 14:30 MDL.....: 0.0

QC DATA ASSOCIATION SUMMARY

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Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	DEN -LC-0012		0004290	0004177
	SOLID	ASTM D 2216-90		0004103	0004065